



Advancing the Global Health Security Agenda: Progress and Early Impact from U.S. Investment



Photo credits clockwise:
Awadh Mohammed Ba Saleh; David Snyder, CDC Foundation; Nicole Hawk

Background

An infectious disease threat anywhere can be a threat everywhere. In today's interconnected world, a pathogen can travel around the globe to major cities in as little as 36 hours.¹ Population growth has brought people closer to one another and closer to animals, increasing the opportunity for pathogens to transmit between animals and humans. Environmental change has also made it easy for disease vectors like mosquitoes to cover more territory. There are many recent examples of new and re-emerging pathogens quickly spreading across the globe – Ebola, Yellow Fever, and cholera in Africa, avian influenza in Asia, novel Middle East Respiratory Syndrome (MERS) coronavirus in the Middle East, and now Zika virus has emerged in the Americas and is re-emerging globally. Unfortunately, we also must be prepared to prevent, detect, and respond to the threat posed by bioterrorism, as well as accidental release from a laboratory.

The Global Health Security Agenda (GHSA), launched in February 2014 in partnership with countries from around the world, is designed to measurably address global vulnerability to these public health threats, strengthen systems, and ensure that a trained workforce has the tools needed to prevent, detect, and respond rapidly and effectively to infectious disease threats. Stopping an outbreak at its source, whether naturally occurring, deliberate, or accidental, requires close collaboration among the health, animal, agriculture, defense, security, development, and other sectors.

The 2014 Ebola epidemic exposed major weaknesses in the global capability for addressing biologic threats,

claimed more than 11,000 lives, cost billions in economic losses, and posed an unprecedented threat to regional stability in West Africa – with the majority of cases in three adjacent West African countries: Guinea, Liberia, and Sierra Leone. As Ebola ravaged the region and weakened the already fragile health systems in these countries, the world was reminded that all countries need GHSA capabilities – safe, secure, and strong laboratories; a well-trained workforce; multi-sectoral collaboration; reliable and sensitive real-time disease surveillance systems; and a command structure to coordinate an effective and focused response. A massive and costly global emergency response was required to gain control of the epidemic in West Africa and to prevent the outbreak from taking root in the United States and other countries.

Experts estimated that the 2003 SARS outbreak cost the global economy between \$30 billion and \$40 billion² in just 6 months. The next severe influenza pandemic, for example, could cost the world economy up to \$6 trillion.³ The enormous costs of pandemics can be averted with strategic investment in capacity building and preparedness. When the GHSA was launched, approximately only 30 percent of all countries were able to report that they had the necessary capacities in place to address public health emergencies, and no common targets or external assessment mechanism existed for swiftly identifying and filling gaps. Fortifying health security needs to be a national priority of governments and a key commitment for multilateral agencies, development banks, non-government organizations, and private sector stakeholders worldwide.⁴

1. Jonas, Olga B. 2013. Pandemic Risk. World Bank, Washington, DC. © World Bank. License: CC BY 3.0 IGO. <https://openknowledge.worldbank.org/handle/10986/16343>

2. <http://www.cdc.gov/dotv/sars/index.html>

3. Gostin, L.O., Mundaca-Shah, C.C., & Kelley, P.W. (2016). Neglected Dimensions of Global Security: The Global Health Risk Framework Commission. JAMA, 315(14), 1451-1452.

4. World Health Organization

The Approach

The United States has made a commitment to assist 31 countries and the Caribbean Community to achieve 11 measurable GHSA targets. The United States is investing \$1 billion in resources across 17 “Phase I” countries to build capacity to prevent, detect, and respond to future infectious disease outbreaks. This funding has helped these countries design and implement 5-year GHSA roadmaps that address specific gaps in disease surveillance, laboratories, emergency management, biosafety and biosecurity, and other disciplines critical to health security. The United States is also working with 14 additional “Phase II” GHSA partner countries and the Caribbean Community to finalize GHSA roadmaps and mobilize international partner resources to achieve the GHSA targets.

With U.S. support, GHSA serves as a catalyst for coordinated global commitment and further investments. Additional donors, including the G-7 Leaders, have now stepped forward to provide a collective commitment to assist 76 countries to reach the capabilities described in the International Health Regulations (IHR 2005) through

The GHSA vision is to achieve a world safe and secure from global health threats posed by infectious diseases – where we can prevent or mitigate the impact of naturally occurring outbreaks and accidental or intentional releases of dangerous pathogens, rapidly detect and transparently report outbreaks when they occur, and employ an interconnected global network that can respond effectively to limit the spread of infectious disease outbreaks in humans and animals, mitigate human suffering and the loss of human life, and reduce negative economic impact.

the GHSA framework. Nordic countries and key G-20 partners have also made specific commitments to assist. Working together, utilizing common targets and national plans, countries and non-governmental stakeholders can work together to improve global health security.

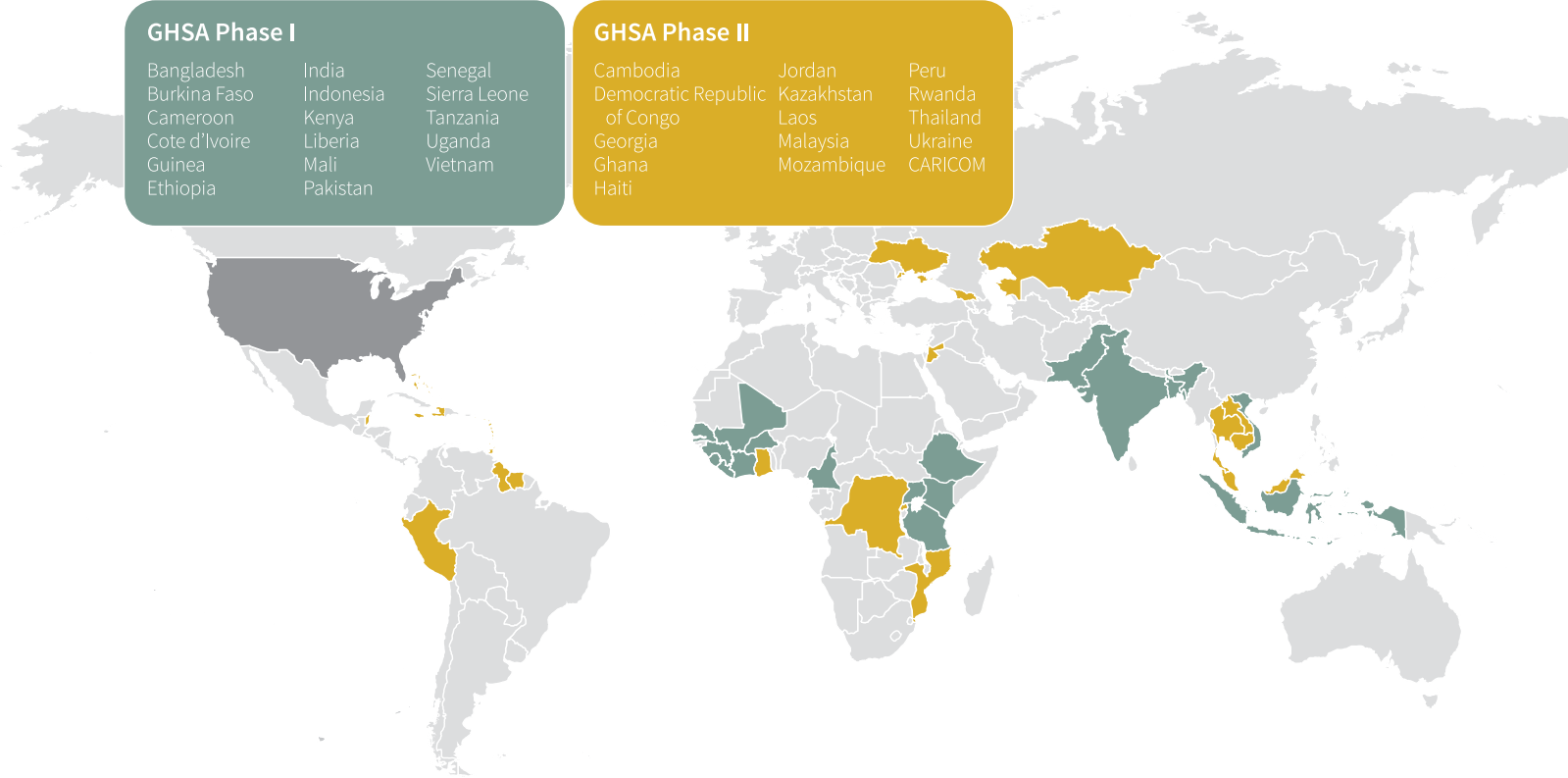
GHSA Phase I and Phase II Partner Countries⁵

GHSA Phase I

- | | | |
|---------------|-----------|--------------|
| Bangladesh | India | Senegal |
| Burkina Faso | Indonesia | Sierra Leone |
| Cameroon | Kenya | Tanzania |
| Cote d'Ivoire | Liberia | Uganda |
| Guinea | Mali | Vietnam |
| Ethiopia | Pakistan | |

GHSA Phase II

- | | | |
|------------------------------|------------|----------|
| Cambodia | Jordan | Peru |
| Democratic Republic of Congo | Kazakhstan | Rwanda |
| Georgia | Laos | Thailand |
| Ghana | Malaysia | Ukraine |
| Haiti | Mozambique | CARICOM |



5. The Caribbean Community (CARICOM) is a grouping of 20 countries: 15 Member States and 5 Associate Members

The Partners

GHSA promotes enhanced preparedness and response capabilities and compliance with the IHR (2005) through an integrated partnership that includes the World Health Organization (WHO), the World Organization for Animal Health (OIE), the Food and Agriculture Organization (FAO), other relevant international organizations, non-governmental stakeholders, and the private sector. The IHR (2005), an effort led through the WHO, are legally binding regulations signed by 196 countries that set requirements for every country to be prepared for epidemic threats. The IHR governs countries' timely and effective response to outbreaks of infectious diseases and other public health emergencies that can cross borders. **The GHSA serves as an engine to advance IHR implementation by providing specific, common targets and step-by-step plans to improve health security.**

GHSA is coordinated by a 10-country multilateral steering group that guides a coalition of 55 nations – each of which have made a commitment to achieve the GHSA targets nationally, regionally, or on a global level.

Within the U.S. Government, teams from the Department of Health and Human Services, the U.S. Centers for Disease Control and Prevention (CDC), U.S. Agency

for International Development (USAID), Department of State, Department of Defense (DoD), Department of Agriculture, and the Federal Bureau of Investigation (FBI) are working to advance the GHSA in order to keep the world safe and secure from infectious disease threats.

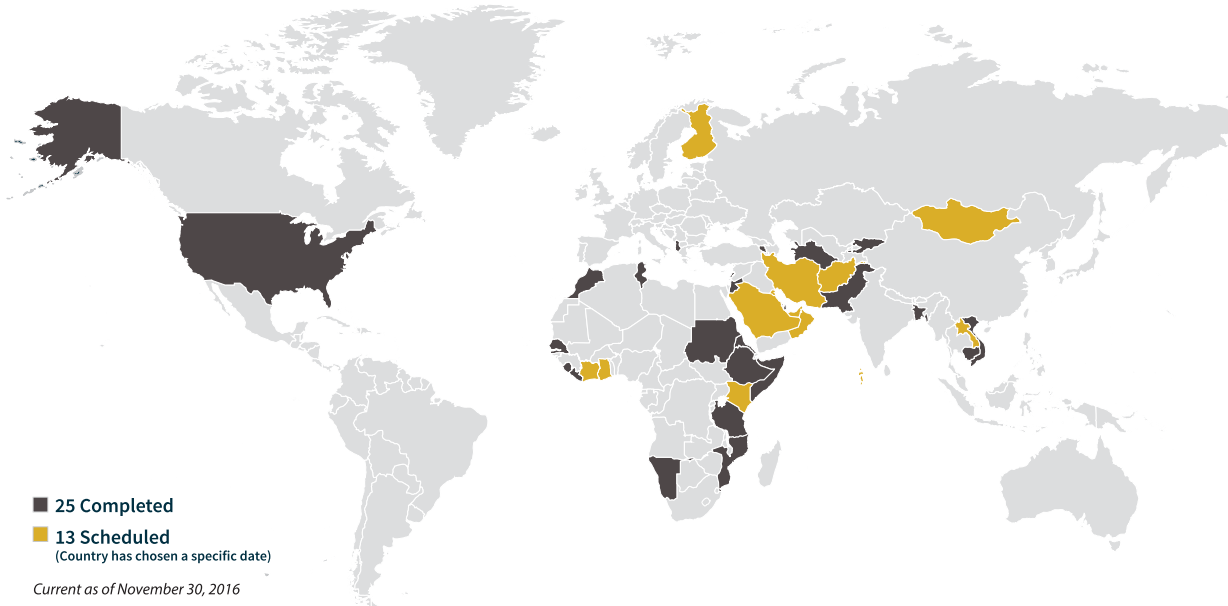
In close coordination with the WHO, the United States, Finland, and other GHSA Steering Group representatives assisted with the development and implementation of the Joint External Evaluation (JEE) – a voluntary, collaborative external assessment mechanism to identify gaps in capacity, determine a baseline, and measure progress in a country's ability to prevent, detect, and respond to infectious disease and other health threats. The JEE mechanism, which combines GHSA targets (also referred to as Action Packages) with additional capabilities required under the IHR, allows countries to determine and address specific gaps within their health security system and to engage with current and prospective donors and other stakeholders to target resources effectively, measurably, and sustainably. The map on Page 4 reflects the countries that have completed or plan to undergo external evaluations of their abilities to prevent, detect, and respond to public health threats.

Donor Partners in Action

A number of donor partners are involved in implementing the GHSA. The G-7 Leaders have made a collective commitment to assist 76 countries and regions, including developing national plans. The Republic of Korea, through its Safe Life for All Initiative, has pledged to contribute \$100 million in 13 countries over the next 5 years, focusing on immunization, national laboratory systems, and workforce development. The Nordic Leaders have made a collective commitment to assist 10 countries. Canada announced it will provide up to \$20 million in 2016 to assist an additional 15 countries to fulfill commitments under the GHSA. Spain and Italy are strengthening laboratories and training personnel in Southeast Asia. The World Bank has approved the first phase of a \$110 million Regional Disease Surveillance Systems Enhancement Project that would assist the member countries of the Economic Community of West African States to strengthen their disease surveillance systems and epidemic preparedness. In addition, Finland, Germany, the Kingdom of Saudi Arabia, the Bill & Melinda Gates Foundation, and other countries have announced their intention to help support the IHR Joint External Evaluation process over the next 5 years.

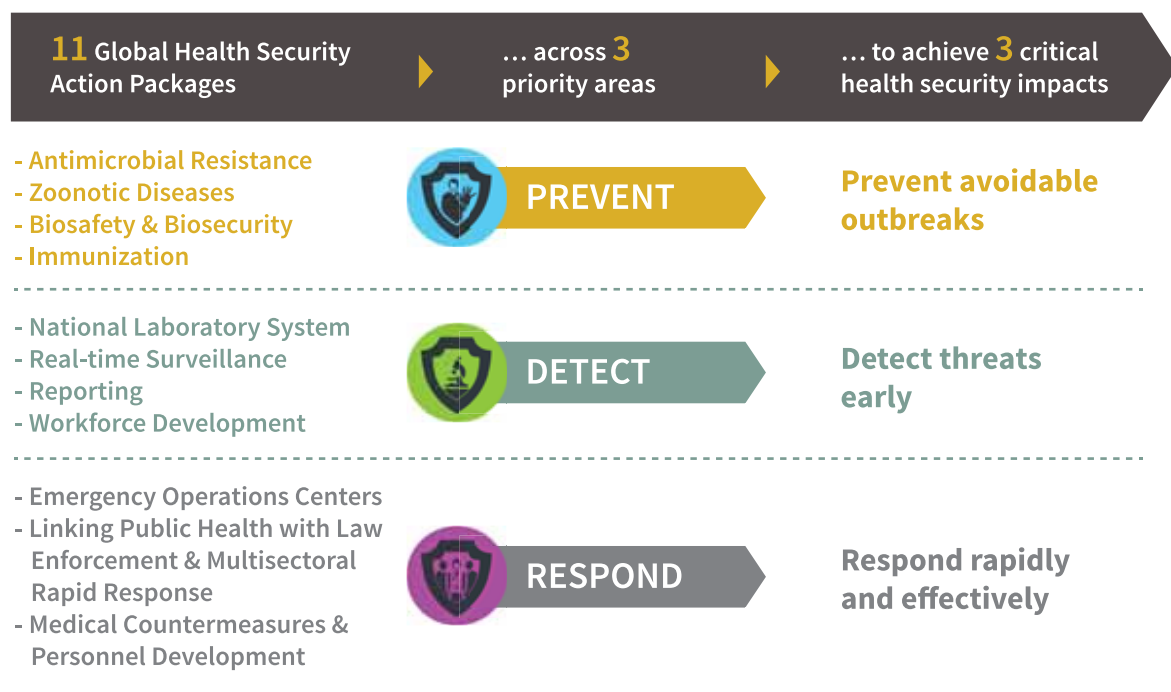
JEE Progress to Date

To date, 25 countries have completed JEE assessments, and 13 others have scheduled a JEE.



Strategic Vision for Global Health Security

GHSA builds capabilities to achieve 11 specific Action Package targets:



Progress to Date

To help ensure a world safe and secure from infectious disease threat, the United States has:

1. Initiated partnerships with 31 countries and the Caribbean region, including finalizing 5-year national plans with each country and implementing new programs in 17 countries to provide \$1 billion in assistance to achieve each of the GHSA targets.
2. Launched, with partners from around the world, a 55-country multilateral, multisectoral effort to accelerate national, regional, and global capability to prevent, detect, and respond to infectious disease threats.
3. Worked collaboratively with G-7, Nordic countries, and key G-20 partners to make collective commitments to assist at least 76 countries and regions to achieve the GHSA targets.
4. Developed, in conjunction with GHSA partners and the WHO, a JEE mechanism to assess country capacity

to prevent, detect, and respond to infectious disease threats, including publishing the U.S. JEE in May 2016 (results posted on GHSagenda.org).

5. Expanded multi-sectoral, non-governmental, private sector, and emerging leader engagement in building health security globally, including the creation of the GHSA Private Sector Roundtable currently composed of 16 multinational corporations with interests in the areas of surveillance, diagnostics, antimicrobial resistance (AMR), supply chain, and response.

Below is description of U.S. support for GHSA implementation, including outputs (examples of U.S. direct investments), shared outcomes (what these investments helped countries and partners to achieve), and early evidence of the impact of GHSA (enhanced prevention, detection, or response to new infectious disease threats that can decrease disease and mortality).

GHSA Program Outputs from U.S. Resources in Partner Countries

Since program implementation began in the summer of 2015, the United States has funded technical assistance, training, commodities, and other activities in direct support of the 11 GHSA Action Package in each of the 17 Phase I countries. For example, the United States financed training and technical assistance activities to strengthen laboratory performance, improve biosafety and biosecurity systems, and upgrade zoonotic disease control programs; and critical commodities and equipment for stockpiles to help respond to new outbreaks. In addition, the United States provided short- and long-term technical assistance, training, and equipment to help establish Emergency Operating Centers (EOCs) and incident management systems and fielded subject matter experts that provided state-of-the-art technical guidance to governments and other partner organizations.

Sixteen of the 17 Phase I countries now have at least 1 full-time epidemiologist working to train new cadres of disease detectives in-country through Field Epidemiology Training Programs (FETPs) to effectively investigate and respond to infectious disease outbreaks before they spillover to other countries. The 17th country will have its full-time epidemiologist in place by early 2017. Since the GHSA launch, these programs have produced more than 1,430 FETP graduates. The United States has helped organize and train more than 1,200 university students in “One Health” student clubs to promote a multi-sectoral response to infectious diseases that integrate the disciplines of animal, human, agriculture, and environment sectors.

The Shared Outcomes of U.S. Investments in the GHSA

After 1 year of GHSA implementation, partner countries have improved their capabilities to prevent, detect, and respond to infectious disease threats.

Preventing Human and Animal Outbreaks in Year 1*

4 Prevent Action Packages	Progress by the numbers	Toward these targets
 Antimicrobial Resistance	10 countries trained health providers to prevent healthcare-associated infections 6 countries expanded surveillance for drug-resistant bacteria	Prevent the spread of drug-resistant pathogens with a strong plan and maintain capacity for detecting AMR and controlling infections
 Zoonotic Disease	13 countries expanded surveillance of zoonotic diseases in humans, wildlife, and livestock 9 countries established or strengthened multisectoral mechanisms to limit animal-to-human spillover or zoonotic diseases	Reduce the emergence and spread of infectious diseases from animals to humans
 Biosafety & Biosecurity	6 countries inventoried stored dangerous pathogens across their laboratories and developed a plan to minimize, consolidate, and secure them 9 countries trained staff on biosecurity and biosafety to prevent avoidable infections	Prevent pathogens from being accidentally or deliberately released by building comprehensive biosafety and biosecurity systems
 Immunization	8 countries expanded surveillance systems to include more vaccine-preventable diseases	Prevent death and illness due to vaccine-preventable diseases through robust national vaccine delivery systems

*Above baseline outcomes achieved since GHSA launch in 2015

Progress on the Ground



500 staff

Antimicrobial Resistance

Sierra Leone trained more than 500 staff in infection prevention control measures and water, sanitation, and hygiene methods in 10 health facilities.

900 viral samples

Zoonotic Disease

Bangladesh analyzed more than 900 viral samples collected from wildlife in close contact with humans.

Detecting Outbreaks Quickly in Year 1*

4 Detect Action Packages

Progress by the **numbers**

Toward these **targets**



National Laboratory System

12 countries trained laboratory technicians
14 countries detected dangerous pathogens using new equipment and capabilities

Detect and diagnose infectious diseases by building strong laboratory networks



Real-time Surveillance

8 countries improved expanded surveillance systems for 3 or more diseases caused by WHO-priority pathogens

9 countries improved surveillance systems to detect outbreaks at the community level

Detect and assess outbreaks in real time using high-quality data from robust surveillance networks



Reporting

9 countries improved timeliness and/or geographic coverage of routine public health threat reporting

12 countries trained community members to detect and report potential health threats

Minimize the impact of health events through increased access to timely and accurate information about outbreaks



Workforce Development

17 countries established, expanded, or participated in Field Epidemiology Training Programs to increase the number of disease detectives who can detect and respond to health threats

Prevent, detect, and respond to infectious disease outbreaks using trained public health workforce

*Above baseline outcomes achieved since GHSA launch in 2015

Progress on the Ground



DETECT

+40% of patient diagnosis

Surveillance

India piloted a hospital-based acute febrile illness surveillance program in 27 sites in 10 states that resulted in confirmed diagnosis in 40 percent of patients in less than 24 hours.

96% of facilities

Reporting

In November 2015, 35 percent of health facilities in Sierra Leone reported to their respective districts. By September 2016, the country achieved reporting to district authorities from 96 percent of health facilities. Now, all districts report to the national level.

Responding to Confirmed Disease Threats in Year 1*

3 Respond Action Packages

Progress by the **numbers**

Toward these **targets**



Emergency Operations Center

16 countries strengthened EOCs to monitor and respond to public health events

12 countries successfully activated EOCs for an exercise or real emergency response

Reduce the impact of public health threats by developing a national system for incident management and real-time surveillance data analysis



Linking Public Health Law and Multisectoral Rapid Response

8 countries strengthened response coordination (e.g., protocols) across multiple sectors (e.g., public health, law enforcement, animal health, customs)

17 countries inventoried national laws related to GHSA action packages

Connect public health, law enforcement, and other sectors to rapidly respond to biological threats within country and across borders



Medical Countermeasures and Personnel Deployment

8 countries improved logistics planning to deploy staff, medicines, and supplies during a public health emergency

Lessen the impact of disease outbreaks through systems that deliver the right medicines and personnel to the right place at the right time

*Above baseline outcomes achieved since GHSA launch in 2015

Progress on the Ground



RESPOND

24 hours

Emergency Operations Centers

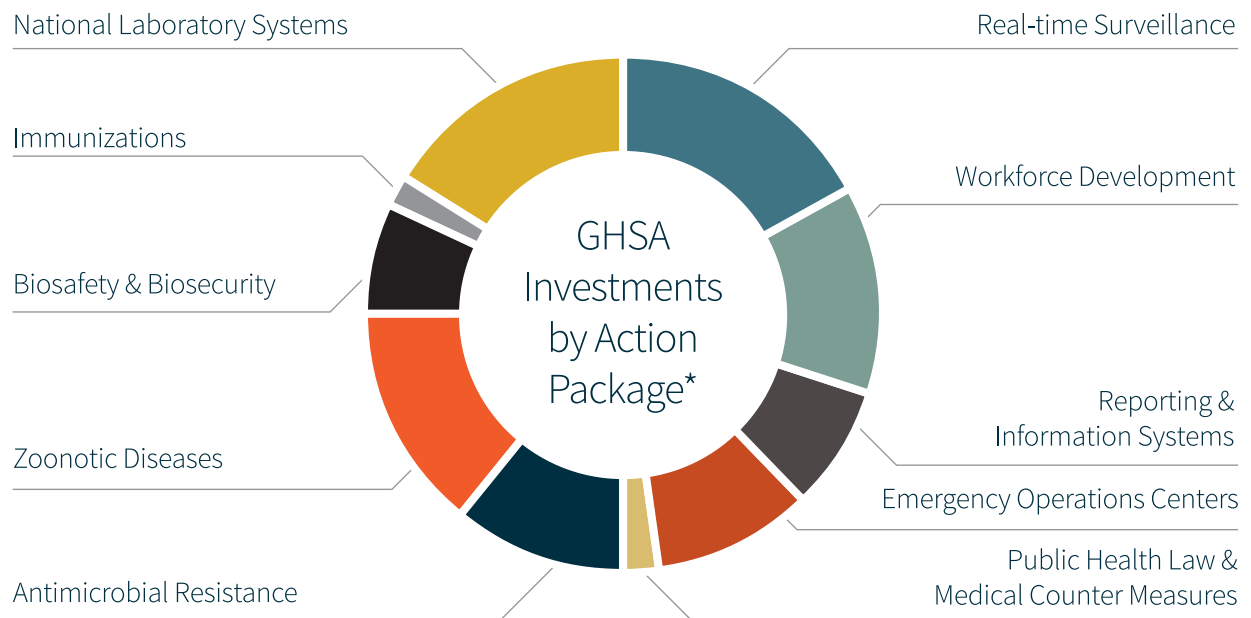
Cameroon's EOC gained experience by responding to 2 real outbreaks and was able to reduce its response time from 8 weeks to 24 hours.

+4 sectors

Linking Public Health with Law & Multisectoral Rapid Response

In Kenya, 4 ministries (Health, Defense, Internal Security, and Agriculture) are sharing information and collaborating to identify public health threats of concern.

Allocation of GHSA Resources across the Action Packages



*This chart represents \$350 million in planned GHSA funds from Year 1 work plans, which encompass 18 months of planning efforts.

Early Evidence of GHSA Impact

The following are examples of prevention, early detection, and effective response to infectious disease threats.

PREVENTING AVOIDABLE OUTBREAKS FROM OCCURRING

Uganda – Enhancing Biosafety and Biosecurity: Continued instability in East Africa highlights the importance of consolidating and securing dangerous pathogens and establishing laboratory systems that maximize the use of modern diagnostics and minimize the storage of especially dangerous pathogens. A multi-year commitment by DoD and CDC has created a secure lab for dangerous pathogens in Uganda, including providing a secure perimeter fence, guard station, x-ray, and metal detector, and facility lighting; secure window and doors; surveillance cameras; and extensive biosafety and biosecurity training, including training on dual-use research of concern.

DETECTING OUTBREAKS AS QUICKLY AS POSSIBLE

Liberia: Disease detectives, or field epidemiologists, play a critical role in identifying and responding to outbreaks within a community. Prior to the 2014 Ebola outbreak, which claimed the lives of thousands in Liberia, the country had few trained disease detectives. Through GHSA support, Liberia now has more than 90 frontline disease detectives trained through the country's Field Epidemiology Training Program (FETP.) Advanced FETP training requires 2 years, but a briefer 3-month course called "Frontline" provides trainees with key detection and response skills to manage health threats early. By the end of 2016, Liberia will have a total of 115 Frontline FETP trained staff, covering all 15 counties and 92 health districts. To date, nearly all graduates have participated in at least one outbreak investigation or response, including the last Ebola cluster in March 2016.

RESPONDING RAPIDLY AND EFFECTIVELY TO CONFIRMED DISEASE THREATS

Guinea and Liberia – A Tale of Two Outbreaks:

The most effective and least expensive way to protect Americans from diseases and other health threats that begin abroad is to stop them before they spread to our borders. In March 2014, limited public health infrastructure and workforce, and weak surveillance and response

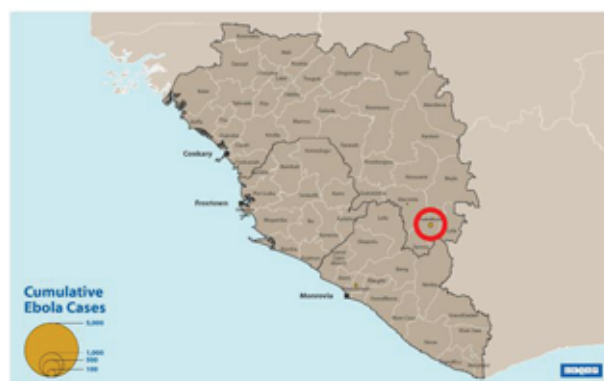
systems in Guinea, Liberia, and Sierra Leone made it difficult to contain the spread of the Ebola virus. In the end, the 2014 outbreak led to more than 28,000 cases of Ebola and more than 11,000 deaths (below) .

March 2014 – February 2016



Two years later, new cases were identified in Guinea and spread to Liberia. Through targeted GHSA support, the U.S. agencies collaborated with host governments and tapped into capabilities developed in the three affected countries to rapidly detect, respond, and prevent another large Ebola outbreak. By March 2016, the outbreak was controlled largely through increased host country capacity, to 13 cases and 9 deaths in the 2 countries (below). This "Tale of Two Outbreaks" reinforces the impact of strong surveillance and response systems, and a trained workforce.

March 2016 – April 2016



Cameroon: In 2016, Cameroon dramatically shortened its response times to infectious disease outbreaks through its new EOC, which was developed with U.S. support. Cameroon's EOC was activated for the first time in response to a cholera outbreak where it took more than 8 weeks to get organized and respond. When H5N1, a highly dangerous avian influenza that started to appear in local poultry, the Cameroonian multi-sectoral response was timely, coordinated, and effective. The Cameroonian EOC incident manager, recently trained in a 4-month-long emergency management fellowship program in the United States, led the response reducing the activation to 24 hours. In addition, the United States provided expert outbreak advice to the government on testing, controlling, and removing potentially infected birds. The United States also provided laboratory reagents and equipment, disinfection materials, and more than 16,000 sets of personal protective gear. More than 67,000 birds were removed as part of the response, eliminating the potential spread from animals to humans. Active monitoring for H5N1 continues and is considered a priority disease by the Government of Cameroon. This effective outbreak response also builds upon U.S. investments in establishing laboratory testing mechanisms, implementing effective surveillance systems, and training staff to combat influenza.

Pakistan: Outbreaks of childhood diseases like measles, diphtheria, and pertussis can be prevented with vaccines but remain common in parts of Pakistan. When outbreaks occur, they are particularly dangerous to children. Between January and March 2016, Pakistan's FETP graduates responded to four distinct outbreaks of vaccine-preventable diseases across five provinces. Disease detectives investigated the reasons for low vaccination coverage and initiated a campaign that provided vaccinations and health awareness sessions that helped to contain the outbreaks and protect thousands of people, including children.

Democratic Republic of Congo: In response to a large, unprecedented yellow fever outbreak in DR Congo in 2016 (with 17 deaths as of September 18), the United States provided surge support to help plan and conduct large-scale vaccination campaigns and to complete laboratory testing of more than 2,000 samples so that "ring" vaccination could be targeted to where confirmed cases were occurring. In total, more than 9 million at-risk persons were vaccinated. Also, the United States purchased reagents and other lab supplies, temporarily hired and trained additional lab and epidemiological staff, and reinforced the vaccination "cold chain." These actions, in collaboration with European Union countries, helped re-establish laboratory systems. The United States also helped conduct an important study to determine the strength and duration of immunity from the lower-dose yellow fever vaccinations that were used due to the ongoing vaccine shortages. As of mid-September, the outbreak had waned, with the last confirmed case on July 12.

Uganda: The United States has been strengthening Uganda's public health laboratory and surveillance systems, training disease detectives, and supporting the Public Health Emergency Operations Center (PHEOC), first established in 2013 for outbreak preparedness and response. In March 2016, the quick activation of the PHEOC, enhanced lab and diagnostic capacities, and disease detectives from the FETP helped the Ministry of Health contain a Yellow Fever outbreak and rapidly establish a surveillance and specimen referral system to identify potential new cases. The response efforts were substantially improved from the 2010 Yellow Fever outbreak where it took more than 40 days just to correctly diagnose the disease.

Examples of Innovative Programming by U.S. Agencies

Burkina Faso (Surveillance): The first three CDC-supported Peace Corps Response Volunteers were placed in Burkina Faso. This is a pilot program that recruits Peace Corps Response Volunteers (PCRVs) to serve as part of the CDC GHSA country teams. The CDC/PCRVs serve at district level with local surveillance officers as counterparts. They are supporting the implementation of the Burkina RESPIRE demonstration project, which is focused on strengthening the Ministry of Health's capacity to detect and respond to severe acute respiratory illnesses, such as pneumonia.

AMR: Six Phase 1 countries have assessed laboratory, real-time surveillance, and/or reporting capacities for AMR pathogens, and eight countries have developed multi-sectoral coordination mechanisms and an integrated "One Health" framework to address AMR, zoonotic diseases, and real-time surveillance and reporting.

Kenya and Uganda (Workforce Development): In 2015, DoD Cooperative Biological Engagement Program (CBEP) and the U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) provided clinical differential diagnosis training to more than 200 participants from Kenya, Uganda, and elsewhere in Africa. The training strengthened the capabilities of clinicians to differentiate between diseases of security concern and those causing similar symptoms throughout the region. In Kenya, CDC and DoD CBEP are collaborating to expand this initiative to include timely reporting of these priority diseases.

Liberia (National Laboratory Systems and Biosafety and Biosecurity): The United States has committed to partner with the Government of Liberia to support a new National Reference Laboratory in Monrovia, which will provide Liberia with the laboratory capacity to rapidly detect and accurately report biological events of significance to the international community and help prevent outbreaks from spreading throughout the region.

Vietnam (Biosafety and Biosecurity): DoD's CBEP conducted training with the Vietnam Ministry of National Defense, Military Medical Department, and Military Institute for Preventative Medicine in support of their initia-

tive to develop a certification curriculum on laboratory level bio-risk management (BRM). The training targeted laboratory managers, BRM trainers, and laboratory staff. This effort assists Vietnam in developing a stronger culture of biosafety and biosecurity practices to prevent incidents in laboratories.

Vietnam (EOC): CDC has supported the development of an interconnected network of EOCs that are fully integrated within the Epidemiology Departments of the four regional public health institutes and the Central Directorate for Preventive Medicine. In addition, CDC has helped develop an information management system situated in the EOCs that integrates the fragmented and segmented surveillance data being collected. The network will facilitate and support the early detection and monitoring of outbreaks and the management of outbreak response. The EOCs are staffed by FETP graduates and fellows and have already been instrumental in the response to the detection of Zika cases in Vietnam.

Ethiopia (Workforce Development): After eight successful cohorts of the Ethiopian FETP at one core university location, the Federal Ministry of Health expanded FETP to eight campuses nationally this year with the goal of meeting GHSA's workforce development targets within 5 years. The Ministry of Health used the standard CDC FETP curriculum to matriculate 180 residents in the first expanded cohort and will assign them to approximately 50 field bases. Additionally, the Ethiopian Public Health Institute strategically implemented Frontline FETP training in the border regions of Ethiopia where reporting rates were the lowest and for surveillance officers based in the capital.

Sierra Leone and Guinea (National Laboratory Systems): DoD's CBEP deployed mobile laboratories to Sierra Leone and Guinea to increase Ebola diagnostic capabilities. In FY 2015, these laboratories received and analyzed more than 6,000 samples for Ebola. In Sierra Leone, 22 samples tested positive for Ebola. In Guinea, 56 samples tested positive for Ebola. These cases were detected more rapidly thanks to the enhanced capabilities provided by these mobile laboratories. These detection capabilities are being transitioned to the Governments

of Sierra Leone and Guinea to ensure rapid and accurate detection in the future.

Liberia (Biosafety and Biosecurity): At the height of the Ebola Virus Disease epidemic in Liberia, the Department of State (DoS) supported the training of 1,200 Liberian National Police (LNP) in Monrovia to limit the spread of, and prevent access to, dangerous hemorrhagic pathogens from the laboratory setting. Subsequently, 500 Guinean Law Enforcement officers were trained on biosafety and biosecurity best practices during the peak of the outbreak in Guinea in early 2015. Both of these efforts enhanced preparedness and response capacity in real-time, provided life-saving personal protective equipment for law enforcement officials, and prevented intentional or accidental infection in the laboratory setting. DoS also supported a Biosecurity Summit for all six West African countries affected by the Ebola crisis in June of 2015 to enhance inter-ministerial and regional coordination that resulted in the creation of Biosecurity Working Groups in all six countries.

Surveillance (Surveillance of Emerging Diseases): Since 1940, hundreds of new infectious diseases in humans have emerged, with more than 70 percent of these originating in animals (Jones et al., 2008). Under the GHSA, USAID and CDC are supporting surveillance activities to detect high-risk zoonotic diseases in key viral families (e.g., coronaviruses, influenzas, and filoviruses) that have been previously associated with regional epidemics and pandemics. This surveillance specifi-

cally targets wildlife and livestock species (bats, rodents, non-human primates, poultry, swine, and wild birds) that have historically been associated with spillover of zoonotic pathogens to people. Animals are sampled at high-risk disease transmission interfaces (such as mining sites, farms, markets) where there is likely exposure to humans. The findings (i.e., both known and unknown high-consequence pathogens) are used by host countries for risk assessments and for strengthening prevention, detection, and response programs. The program is actively sampling wildlife in 11 countries and has taken samples from more than 8,000 animals.

Uganda (Zoonotic Diseases): Multi-disciplinary teams of students are building practical skills in infectious disease management and control with support from the USAID-funded One Health Workforce Project and the One Health Central and Eastern Africa university network. At the request of the Ministry of Health, six One Health Student Club members from Makerere University joined a rapid response team investigating a Rift Valley Fever in the Kabele District. The participating One Health students improve their practical skills in disease investigation and response through this and other community service programs. In all, One Health Student Clubs are active in public health or veterinary university campuses in seven African countries. Through these clubs, more than 1,000 students from a variety of health backgrounds have participated in outreach activities and health trainings.

Looking Forward

The United States' support has resulted in significant progress in the first year of GHSA implementation. We are working with GHSA partner countries to establish or strengthen multi-sectoral systems able to prevent, rapidly detect, and effectively respond to infectious disease threats, whether naturally occurring or caused by accidental or intentional release. Countries are demonstrating strong commitments to improve their own health security through leadership, policy, staffing, and resources. Moving forward, there are great opportunities to build on this momentum to conduct JEEs, reach targets, and focus attention on health as a security issue. This is truly a global priority with a coalition of 55 countries involved in the effort. U.S. commitment to measurably advance

the Global Health Security Agenda, leveraging commitments from global partners and stakeholders, has never been greater.

The world is more connected than in any time in human history. Distance no longer affords protection from disease, viruses, epidemics. Our connectedness provides opportunity for people all over the world, but it also poses serious challenges with implications for our health security and for the stability and security of our populations and economies. Until each country has the capacity to stop an outbreak at its source, Americans and people around the world remain vulnerable.

Annex

U.S. Government Departments Agencies, and Offices	Key Roles as defined by the Executive Order – Advancing the Global Health Security Agenda to Achieve a World Safe and Secure from Infectious Disease Threats (November 4, 2016): In conjunction with the other relevant agencies, departments, and agencies will:
Executive Office staff (National Security Council, Office of Man- agement and Budget, and Office of Science and Technology Policy)	<ul style="list-style-type: none"> • Convene a GHSA Interagency Review Council (Council) to perform the responsibilities described in the Executive Order – Advancing the Global Health Security Agenda to Achieve a World Safe and Secure from Infectious Disease Threats. • Serve as chair of the Council as designated by the Assistant to the President for National Security Affairs, in coordination with the Assistant to the President for Homeland Security and Counterterrorism.
Department of State	<ul style="list-style-type: none"> • Engage Chiefs of Mission, country teams, and regional and functional bureaus within the Department of State to promote the GHSA with international partners and to facilitate country-level implementation of U.S. programmatic activities. • Monitor and evaluate progress toward achieving GHSA targets, determine where more work is needed, and work with agencies and international partners to identify the partners best placed to achieve the GHSA targets for countries the United States has made a commitment to assist. • Facilitate implementation and coordination of Department of State programs to further the GHSA. • Coordinate planning, implementation, and evaluation of GHSA activities with the U.S. Global Malaria Coordinator at the U.S. Agency for International Development, and the U.S. Global AIDS Coordinator at the Department of State in the countries the United States has made a commitment to assist. • Lead diplomatic outreach, including at senior levels, in conjunction with other relevant agencies, to build international support for the GHSA. • Work, in conjunction with other relevant agencies, with other donors and non-governmental implementers in partner countries in order to leverage commitments to advance the GHSA with partners. • Coordinate, in conjunction with other relevant agencies, the U.S. Government relationship with foreign and domestic GHSA non-governmental stakeholders, including the private sector, non-governmental organizations, and foundations, and develop, with consensus from the Council, an annual GHSA non-governmental outreach strategy.
U.S. Agency for International Development	<ul style="list-style-type: none"> • Facilitate implementation and coordination of U.S. Agency for International Development programs to further the GHSA, as well as provide technical expertise to measure and evaluate progress in countries the United States has made a commitment to assist. • Provide, in conjunction with other agencies, strategic technical guidance for achieving GHSA targets. • Work, in conjunction with interagency partners and the in-country GHSA teams, with other donors and non-governmental GHSA implementers in partner countries in which U.S. Agency for International Development programs are active in order to coordinate and leverage commitments to advance the GHSA with partners.
Department of Defense	<ul style="list-style-type: none"> • Facilitate implementation and coordination of Department of Defense programs to further the GHSA, as well as provide technical expertise to measure and evaluate progress in countries the United States has made a commitment to assist. • Work, in conjunction with interagency partners and the in-country GHSA team, with other donors and non-governmental implementers in partner countries in which Department of Defense programs are active in order to coordinate and leverage commitments to advance the GHSA with partners. • Coordinate and communicate, in conjunction with other relevant agencies, with defense ministries with regard to the GHSA, including at the GHSA Ministerial and Steering Group.

Department of Health and Human Services

- Represent, in conjunction with other relevant agencies, the United States at GHSA Ministerial and Steering Group meetings and in working with G7 and G20 Health Ministers on the GHSA, and coordinate U.S. Government support for those activities.
- Provide overall leadership and coordination for the GHSA Action Packages, which consist of country commitments to advance and share best practices toward specific GHSA targets, including serving as the primary point of contact for the Action Packages, providing support to Action Package leaders, and tracking overall progress on the Action Packages.
- Coordinate U.S. Government support for and participation in external evaluations, including the WHO JEE tool and the Alliance for Country Assessments for Global Health Security and IHR Implementation.
- Represent, in conjunction with other relevant agencies, the United States in coordination and communication with the WHO regarding the GHSA.
- Facilitate, no less than every 4 years, the request for an external assessment, such as the process outlined within the WHO JEE tool, of U.S. Government domestic efforts to implement the IHR and the GHSA and work to publish the assessment to the general public.
- Consolidate and publish to the general public an external assessment of U.S. domestic capability to address infectious disease threats and implement the IHR, including the ability to achieve the targets outlined within the WHO JEE tool and including the gaps identified by such external assessment.

U.S. Centers for Disease Control and Prevention

- Facilitate implementation and coordination of U.S. Centers for Disease Control and Prevention programs to further the GHSA, as well as provide technical expertise to measure and evaluate progress in countries the United States has made a commitment to assist.
- Provide, in conjunction with other agencies, strategic technical guidance for achieving GHSA targets.
- Provide, in coordination with the Department of Health and Human Services, strategic technical support for and participate in external assessments, including the WHO JEE tool, and the Alliance for Country Assessments for Global Health Security and IHR implementation. Work, in conjunction with interagency partners and the in-country GHSA team, with other donors and non-governmental implementers in partner countries in which the U.S. Centers for Disease Control and Prevention programs are active in order to coordinate and leverage commitments to advance the GHSA with partners.

Department of Justice, Attorney General acting through the Federal Bureau of Investigation

- Serve, in conjunction with other relevant agencies, as the U.S. Government lead for GHSA targets relating to linking public health and law enforcement, and coordinate with INTERPOL on the GHSA and its successful implementation.
- Facilitate implementation and coordination of FBI programs to further the GHSA, as well as provide technical expertise to measure and evaluate progress in countries the United States has made a commitment to assist.
- Work, in conjunction with interagency partners and the in-country GHSA team, with other donors and non-governmental implementers in partner countries in which FBI programs are active in order to coordinate and leverage commitments to advance the GHSA with partners.

Department of Agriculture

- Represent, in conjunction with other relevant agencies, the United States in coordination and communication with the FAO and OIE with regard to the GHSA.
- Facilitate implementation and coordination of Department of Agriculture programs to further the GHSA, as well as provide technical expertise to measure and evaluate progress in countries the United States has made a commitment to assist.
- Work, in conjunction with interagency partners and the in-country GHSA team, with other donors, contributing international organizations, and non-governmental implementers in partner countries in which Department of Agriculture programs are active in order to coordinate and leverage commitments to advance the GHSA with partners.

Department of Homeland Security

- Assess the impacts of global health threats on homeland security operations.
- Lead, in conjunction with the Secretary of Health and Human Services, the Secretary of State, and the Secretary of Agriculture, U.S. Government GHSA activities related to global health threats at U.S. borders and ports of entry.

